

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE. Assistant Editor: FRANK OWEN STETSON.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for September, 1905, is based on data from about 3495 stations, classified as follows:

Weather Bureau stations, regular, telegraph, and mail, 176; West Indian Service, cable and mail, 13; River and Flood Service, regular 52, special river and rainfall, 363, special rainfall only, 98; cooperative observers, domestic and foreign, 2565; total Weather Bureau Service, 3267; Canadian Meteorological Service, by telegraph and mail, 33; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25. Total, 3495.

Since December, 1904, the Weather Bureau has received an average of about 1700 reports from as many observers and vessels, giving international simultaneous observations over the Atlantic and Pacific oceans at 12 noon, Greenwich time, or 7 a. m., seventy-fifth meridian time. These are charted, and, with the corresponding land observations, will form the framework for daily weather charts of the globe.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, General Superintendent of the United States Life-Saving Service; Capt. H. M. Hodges, U. S. N. (Retired), Hydrographer, United States Navy; Anastasio Aljaro, Director of the Physico-Geographic Institute, San José, Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Sec-

retary, Meteorological Office, London; H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Enrique A. Del Monte, Director of the the Meteorological Service of the Republic of Cuba; Rev. L. Gangoiti, Director of the Meteorological Observatory of Belen College, Havana, Cuba.

Attention is called to the fact that at regular Weather Bureau stations all data intended for the Central Office at Washington are recorded on seventy-fifth meridian or eastern standard time, except that hourly records of wind velocity and direction, temperature, and sunshine are entered on the respective local standards of time. As far as practicable, only the seventy-fifth meridian standard of time, which is exactly five hours behind Greenwich time, is used in the text of the REVIEW. The standards used by the public in the United States and Canada and by the cooperative observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is 157° 30', or 10^h 30^m west of Greenwich. The Costa Rican standard meridian is that of San José, 5^h 36^m west of Greenwich.

Barometric pressures, whether "station pressures" or "sea-level pressures", are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

In conformity with Instructions No. 43, March 29, 1905, the designation "voluntary", as applied to the class of observers performing services under the direction of the Weather Bureau without a stated compensation in money, is discontinued, and the designation "cooperative", will be used instead in all official publications and correspondence.

Hereafter the titles of the respective forecast districts will be as used in the current REVIEW to accord with paragraph 236 of Station Regulations, dated June 15, 1905.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

Three barometric depressions of moderate intensity influenced the weather of portions of the British coasts during the first and third decades of the month. From the 7th to 10th a depression remained nearly stationary near the north coast of Scotland and then moved slowly eastward to Scandinavia. From the 22d to 26th and 27th to 30th depressions advanced from off the south coast of Ireland to continental Europe. In the vicinity of the Azores the barometer continued comparatively high, except on the 20th, when it fell to 29.82 at Horta, Fayal, with a maximum wind velocity of 30 miles per hour from the southwest. The depressions that passed over the Atlantic from the American Continent were of small intensity.

On the morning of the 6th a disturbance of apparent small diameter appeared to the eastward of Barbados, West Indies; during the afternoon of that day it passed to the westward of Barbados, and by the morning of the 7th had advanced into the eastern Caribbean Sea. The severity of this storm is indicated by the experience of a schooner that sailed from Bridgetown on the morning of the 6th bound for Surinam. When 40 to 50 miles from port the voyage was abandoned on

account of heavy seas and high squally winds, and the vessel returned to Bridgetown where it was thrown by heavy seas on the pierhead and totally wrecked, with the loss by drowning of the captain and one of the crew. Advices were issued to West Indian ports regarding the character and probable course of this disturbance on the 6th and 7th. After the 7th it appeared to drift slowly westward over the Caribbean Sea as a shallow depression of considerable area in which no evidence of high winds has been furnished.

The most important storm of the month in the United States occurred over the upper Lake region during the 2d and 3d, attending the passage of low area I; on the north Pacific coast on the night of the 25th; and on the middle coast of the Gulf of Mexico from the 26th to the 30th, attending low area XII. On Lake Superior, damage to shipping and loss of life attended the storm of the 2d and 3d. Damage of a minor character only was caused by the north Pacific storm, and no serious damage has been reported in connection with the Gulf storm. The passage of low area I was attended by severe thunderstorms and rainstorms in the upper Mississippi and lower Ohio valleys and the western Lake region, and by

exceptionally heavy rains in New York and New England. On the 9th and 10th violent electrical and rainstorms prevailed throughout the Southwest, in connection with low area II, and in Missouri and Oklahoma and Indian Territories small streams were flooded and damage was caused to property. From the 13th to the 15th heavy rainstorms and high winds occurred in the lower Missouri Valley and heavy rains during the succeeding three days caused floods in the smaller streams of eastern Kansas and Missouri that flooded thousands of acres of corn fields in bottom lands. Flood stages for which warnings were issued occurred in the Missouri River east of Kansas City, and in the middle Mississippi River south of the mouth of the Missouri.

Frosts occurred in Missouri and Wisconsin on the 13th and in Michigan and New York on the 14th. High wind during the night of the 13-14th is reported to have saved the Cape Cod cranberry crop from destruction by heavy frost. On the morning of the 14th frost was forecast for the morning of the 15th in the cranberry bogs of New Jersey and considerable damage by frost is reported to have been caused, the morning of the 15th, to cranberries in some parts of the New Jersey district.

Snow was reported in the mountain districts of Vermont on the 13th, in the Adirondacks on the 15th, and in the mountains of Colorado on the 18th. Six inches of snow was reported on Mount Washington on the 25th.

BOSTON FORECAST DISTRICT.

The month, as a whole, was wet and cool. (The average rainfall for the month was 5.41 inches, having been exceeded in September but once, viz, in 1884, when an average rainfall of 8.29 inches was reported.) Light to killing frosts were quite general on the 15th and 27th, and in many sections of the Northern States the temperature fell to freezing or below. Frost warnings were issued to cranberry growers on the 14th and 27th. Reports received from the growers showed temperatures ranging from 26° to 29°, with moderate to heavy frosts in the 15th in the bogs. On the 27th frost was general, with temperatures from 24° to 26° on the bogs. The warnings were timely and of benefit to cranberry interests.—*J. W. Smith, District Forecaster.*

CHICAGO FORECAST DISTRICT.

The storm from the southwest reached Lake Michigan by the morning of the 2d, and then passed very slowly eastward, causing brisk to high winds. Several wrecks occurred on Lake Superior, the principal one being that of the *Sevana*, a large steamship, the master of which mistook the Raspberry Island light for that of the Sand Island light and consequently ran upon the reef. The only other storm of consequence reached the Lake region on the morning of the 19th, and passed thence to the northward of Lake Superior without causing any material damage.

Frost warnings were issued for the lowlands of Minnesota and Wisconsin on the 2d, 3d, 4th, and 5th in advance of the cold weather which overspread the Northwest, but the weather continued cloudy and the temperature did not quite fall to the frost point in the States specified. Special attention was given to the prediction of frost in the cranberry marshes of Wisconsin, and the predictions of frost for the balance of the month were completely verified. Warnings were issued on the 12th, and they were followed by a minimum temperature of 26° and 30° at Mather and Grand Rapids, Wis., respectively; again on the 22d the warning was followed by freezing temperature on the marshes. Warnings on the 24th preceded low temperatures over the entire upper Lake region. The minimum in the marshes near Grand Rapids fell as low as 22°.—*H. J. Cox, Professor and District Forecaster.*

LOUISVILLE FORECAST DISTRICT.

There were no marked disturbances during the month. The weather was mostly dry and warm, with a few scattered rain

periods of short duration and one cool spell from the 3d to the 7th and on the 26th on which latter date light frost occurred in the eastern part of Kentucky.—*F. J. Walz, District Forecaster.*

NEW ORLEANS FORECAST DISTRICT.

Weather conditions were moderate until the 26th, when a general low pressure area appeared in the Gulf of Mexico. From the 26th to the evening of the 28th the disturbance was apparently moving from the central Gulf toward the northwest, and on the morning of the 29th the storm-center moved into Louisiana. Although the storm did not exhibit specially severe features, high winds and high tides prevailed along the central Gulf coast, and shipping remained in port until advised by the Weather Bureau that danger had passed. Public opinion is that the warnings prevented much damage. The New Orleans Item of September 30, 1905, remarks in connection with this storm as follows:

The warnings of the United States Weather Bureau have been, as usual, exceptionally accurate and timely. All shipping interests heeded the warnings and remained in port until advised that all danger had passed. In such instances the value of the warnings to the shipping and commercial interests can not be estimated. The money value of the property saved in such a case is doubtless greater than that expended in the operation of the Weather Bureau for an entire year. It is a noteworthy fact that no storms have occurred in recent years without timely warnings, so efficient has the weather service become in this work.

I. M. Cline, District Forecaster.

DENVER FORECAST DISTRICT.

The month was characterized by mild, pleasant weather. Timely warnings were issued for the sharp falls in temperature and killing frosts that occurred during the closing days, and for most of the light frosts that occurred earlier in the month.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.

The month was one of normal conditions and little rain fell, except in the southern portion of the State. On the 26th conditions were favorable for a rapid southerly movement of a depression over Washington; the movement was, however, along a line farther east than anticipated, in fact, on the eastern slope of the Sierra Nevada rather than on the western slope. Warnings were issued to raisin growers and others interested. Showers fell in the central valleys of California, but not along the coast. Rain fell in the southern mountains of California, and would have injured drying crops but for warnings sent on the 27th and night of the 28th.—*A. G. McAdie, Professor and District Forecaster.*

PORTLAND FORECAST DISTRICT.

The fall rains began in northwestern Washington on the 7th, and on the 12th showers and thunderstorms in western Oregon, Washington, and northern Idaho checked forest fires that had been burning for some time. During the last half of the month frost occurred frequently in eastern Oregon, eastern Washington, and Idaho, for all of which timely warnings were issued. Storm warnings for moderate gales were issued on the 16th, 19th, 25th, and 27th.—*E. A. Beals, District Forecaster.*

RIVERS AND FLOODS.

The only feature of special interest in connection with the work of the River and Flood Service during the month was the flood in the Missouri River east of Kansas City, Mo., and in the Mississippi River from Alton to Cairo, Ill., a very unusual occurrence for the time of the year, and an absolutely unprecedented one with regard to the rapid rise of the water. The flood was not of great magnitude, but coming, as it did, at a time of the year when nothing but the usual seasonal decline was expected, it caused a considerable amount of damage to property that was thought to be secure from loss by water.

The flood was caused by the heavy rains from the 15th to